Dockets

Federal Communications Commission
Washington, D.C. 20554

JUL 2 4 1996

Mr. Joseph de Courcelle
1055 West Germantown Pike
Norristown, Pennsylvania 19403

DOCKET FILE COPY ORIGINAL

Dear Mr. de Courcelle:

Thank you for your letter of June 4, 1996, which was forwarded to us from the office of Senator Arlen Specter, regarding the Commission's decision to freeze acceptance of paging applications. You express concern that the suspension of processing of paging applications will adversely affect small businesses that provide paging services. You also express concern that paging frequencies will be awarded in a competitive bidding process, to the detriment of small businesses.

The Commission is currently conducting a rulemaking proceeding that proposes to transition from licensing paging frequencies on a transmitter-by-transmitter basis to a geographic licensing approach, using auctions to award licenses where there are mutually exclusive applications. In conjunction with that proceeding, the Commission initially froze processing of applications for paging frequencies. On April 23, 1996, the Commission released a First Report and Order in WT Docket 96-18 and PP Docket 93-253, which adopted interim measures governing the licensing of paging systems and partially lifted the interim freeze for incumbent paging licensees. For your convenience and information, enclosed is a copy of the Press Release concerning the First Report and Order, which includes a summary of the principal decisions made. Specifically, small and medium sized incumbent paging companies will be permitted to expand their service areas if the proposed new site is within 65 kilometers (40 miles) of an authorized and operating site. These interim rules will remain in effect until the Commission adopts final rules in the paging proceeding, which should happen shortly.

The Commission's adoption of the paging freeze did not require prior issuance of a Notice of Proposed Rule Making. Indeed, the Commission has imposed freezes in a number of other proceedings to facilitate the transition to geographic licensing and auctions, including Multipoint Distribution Service, 800 and 900 MHz Specialized Mobile Radio (SMR) Service, Location and Monitoring Service, 220 MHz Service and 39 GHz Service. Our decision in these proceedings to suspend acceptance of applications while the related rulemaking is pending advances two critical goals -- preservation of our ability to assign licenses through auctions, and deterrence of license fraud and speculation. In particular, we are concerned that the potential benefits of geographic area licensing, with competitive bidding used to select

from among competing applicants, would be undermined by continuing to invite site-specific applications for "free" spectrum on a first-come, first-served basis.

Assigning frequencies by auction, in turn, helps deter fraud and speculation and ensures that this valuable public resource is assigned rapidly and efficiently to the parties who value it the most, rather than given away to the first party who files its application with the Commission. The Commission has stated its belief in other contexts (such as Specialized Mobile Radio) that auctions will minimize administrative or judicial delays in licensing, particularly in comparison to other licensing methods such as comparative hearings, lotteries (which are specifically prohibited by the statute if the service is auctionable), or "first-come, first-served" procedures. We emphasize that the Commission's proposal to auction paging frequencies applies only to issuance of initial licenses in the service, and is not intended to affect rights afforded to licensees operating under existing authorizations.

The Commission's proposal to auction paging frequencies is consistent with Section 309(j) of the Communications Act, which sets forth certain criteria for determining when auctions should be used to award spectrum licenses. Pursuant to these criteria, auctions are to be used to award mutually exclusive initial licenses or construction permits for services likely to involve the licensee receiving compensation from subscribers. The statute also requires that the Commission determine that auctioning the spectrum will further the public interest objectives of Section 309(j)(3) by promoting rapid development of service, fostering competition, recovering a portion of the value of the spectrum for the public, and encouraging efficient spectrum use.

Moreover, the Commission has proposed to take a number of steps to ensure that paging providers that are small businesses are not adversely affected by the transition to geographic area licensing and the use of competitive bidding procedures to award paging licenses. For instance, we are committed to establishing licensing areas of a size that will provide realistic bidding opportunities for small and medium-sized operators. We have also proposed to allow paging licensees to partition their licensing areas in order to promote quicker build-out of small markets and rural areas. In addition, we have proposed special provisions in our competitive bidding rules for small businesses to facilitate their participation in the auction process, including bidding credits and installment payment provisions.

Thank you for your inquiry.

Sincerely,

Edward R. Jacobs/for

David L. Furth
Chief, Commercial Wireless Division
Wireless Telecommunications Bureau

Enclosure

Copy to: The Honorable Arlen Specter

ARLEN SPECTER
PENNSYLVANIA

COMMITTEES:
INTELLIGENCE
JUDICIARY
APPROPRIATIONS
VETERANS' AFFAIRS

# United States Senate

WASHINGTON, DC 20510-3802

PRB
pr-paging
3498

July 1, 1996

The Honorable Reed Hundt
Chairman
Federal Communications Commission
1919 M Street, NW
Room 814
Washington, DC 20554

Dear Chairman Hundt:

I am writing on behalf of my constituent, Mr. Joseph de Courcelle, President of Spectrum Communications Corporation in Norristown, Pennsylvania.

I am advised by Mr. de Courcelle that the Federal Communications Commission has imposed a freeze on all new Radio Paging licenses. According to Mr. de Courcelle, paging equipment sales make up nearly 90% of his business. It is my understanding that the freeze has led to a 95% decrease in Spectrum's sales, as well as a general decline in the paging industry. Mr. de Courcelle is concerned that unless the freeze on radio paging licenses is lifted, his business will no longer be able to operate.

I have enclosed a copy of Mr. de Courcelle's letter for your reference. I would greatly appreciate an explanation of the ban on radio paging licenses with respect to the above case. Please respond directly to Mr. de Courcelle at 1055 West Germantown Pike, Norristown, PA, 19403, and forward a copy of this response to the attention of Stephanie Stitzer of my staff.

Thank you for your attention to this matter.

Sincerely,

Arlen Specter

Enclosure
AS/ss

cc: Joseph de Courcelle

**SPECTRUM COMMUNICATIONS CORP.**

1055 W. GERMANTOWN PIKE
NORRISTOWN, PA 19403-3924 U.S.A.

FAX: (610) 631-5017
PHONE: (610) 631-1710

June 4, 1996

Office of Senator Arlen Specter
Attn: Ms. Stephanie Stitzer
Washington, D.C. 20510

RE: Our phone conversation of yesterday.

Dear Stephanie and Mr. Specter,

I know you and your staff are very busy, so I'll make this brief - although it is Extremely Important.

I am the owner & President of a small Electronics Manufacturing firm in the suburban Norristown area. We have been in business for 22 years, and we employ 15-22 very good, hard-working people. We design and manufacture Radio Communications Equipment for the 2 Way Radio Market, (such as Police, Fire, and Business 2 Way Radio), and in the last 8 years we have also gotten into the Radio Paging equipment market.

While our conventional 2 Way Radio equipment has been impacted by off shore competition in the past several years, our Radio Paging equipment sales have been growing - to the point where Paging Transmitters (and many related accessories) are about 90% of our business. As you may know, Paging is one of the "new" P.C.S. or "Wireless" Radio Services now starting to grow rapidly. (Cellular Telephones are a closely related industry.) [PCS is "Personal Communications Services".] This Industry is slated to show Tremendous Growth over the next 10-20 years, and we would like to provide hundreds of local jobs in the future - if we can get the support we badly need.

Our problem is: in early February, 1996, the FCC suddenly, and with no advance notice, put a "Freeze" on all new Radio Paging Licenses- (except that it would not apply to the few Giant, Multi-Million Dollar nationwide Paging Licensees - who do not buy from us anyway). This "Freeze" has thrown the entire Paging Industry in the U.S. into a state of Chaos and Dispair. The Industry has literally ground to a HALT!!

Our Sales for Paging Equipment have literally fallen to just about ZERO!!! [NOT Down just 20 or 30%, but DOWN about 95% !!!] As mentioned above, Paging Equip. accounts for about 90% of our Sales. This FCC Freeze is absolutely KILLING OUR BUSINESS!! No business can survive like this, and we certainly cannot survive much longer. It is not only affecting us, but many, many small through large Manufacturing and Paging companies all over the USA. We heard that one 30 man co. in the Midwest only sold 2 Paging Terminals last month, (appx. $4,000. total!). Obviously, there's no way a 30 person co. can survive very long with only $4K in Sales every month!! Paging service companies have totally STOPPED putting in new transmitter sites, and even STOPPED Planning them. This will have a very negative impact for many months to come. If this Freeze doesn't end almost immediately, it could drive this company and many others into Bankruptcy!! And that would be a disaster for me and everyone here who has worked so long and very hard for almost a quarter century to build-up this business!

If that happened, I would lose not only this business, but my Home and Life Savings, which collateralize our bank loans!! Also, everyone here and at similar firms would be thrown out of work - including many good people (and Voters) who have been doing this type of work for their entire life! We certainly hope that you can put pressure on the FCC to immediately END this Freeze on new Paging Licenses, and get this good industry moving again quickly.

NOTE that normally the FCC issues a "Notice of Proposed Rule Making" for something like this, and many months go by before anything actually happens - if it EVER does. But in this case, that normal procedure wasn't followed at all. So, their entire Freeze may be Illegal, since "Due Process of Law" wasn't followed!!

Also NOTE that the FCC now wants to Auction off these Paging Licenses. This has never been done before in the whole History of Radio Communications - except in the last 1½ yrs. for the new PCS Radio-Telephone Services that will be starting in the US in the next 1-2 yrs. Note that we are totally AGAINST Auctioning off these Paging Licenses since the hundreds or thousands of small to medium sized Paging Companies in the US simply will not be able to afford to pay Millions of dollars for a License, (that they previously got for a very small fee for processing)!! So small to medium sized businesses may be hurt very badly and permanently by this FCC action. We all often hear President Clinton and other Congressmen and Senators praise "Small Business". But in reality, this FCC action to freeze all new paging licenses, and then auction them off for Millions of dollars is obviously just Another Gift to the big, huge, multi-million dollar firms in the U.S. like the Bell companies, NYNEX, Motorola, etc,etc. Again, the "little guys" get knocked out of the ballgame again - (and maybe even killed-off permanently, business-wise!).

We would all greatly appreciate it if you could contact the FCC Commissioners IMMEDIATELY, and convince them to IMMEDIATELY RELEASE this Freeze on Paging Licenses. Thank you very much!

Sincerely,

J. Joseph de Courcelle III

J. Joseph de Courcelle, III
President

**SPECTRUM COMMUNICATIONS CORP.**
1055 W. GERMANTOWN PIKE
NORRISTOWN, PA 19403-9616 U.S.A.
FAX: (610) 631-5017
PHONE: (610) 631-1710

## SPECTRUM COMMUNICATIONS CUSTOMERS

In the past few years, Spectrum Customers have included:

RCA - Radio Corp. of America - David Sarnoff Laboratory
General Electric
Cushman Electronics
The Heath Corporation
M.I.T. - Massachusetts Institute of Technology
N.A.S.A.
U.S. Department of the Army
U.S. Department of the Navy
U.S. Marine Corps
Chilean Department of the Navy
N.A.T.O.
Supreme Command HD. - Thailand Gov't.
U.S. Air Force
U.S. Military Affiliate Radio System (MARS)
U.S. Civil Air Patrol
Red Cross
University of Florida
University of Hawaii
Hawaii Institute of Marine Biology
University of California - Lawrence Livermore Laboratory
Sandia Laboratory
National Weather Service
Georgia Institute of Technology
New York State Board of Education
New York Stock Exchange
U.S. Embassy - Bangkok, Thailand
Ford Motor Company
Indonesian Embassy
His Majesty King Hussein of Jordan
I.B.M.
Sperry Univac
Data General
Wang Laboratory
TRW Corporation
Monsanto
EXXON Corporation
Mobile Oil Corporation
Mount Washington Observatory
Union Carbide Corporation
Federal Aviation Administration
Litton Industries
Grumman Aerospace Corporation
General Telephone Co. of Michigan
Houston Natural Gas Company
(Houston Pipe Line)
Caterpillar Tractor Company
Niagara Mohawk Power Company
Philadelphia Electric Company
ARAMCO Services Company
NBC News
Rockwell International
AT & T Information Systems
Lockheed Electronics Corporation
Ford Aerospace Corporation
Boeing Aircraft Corporation
Loma Linda Medical Center
KSL Radio
Kettering Medical Center

And many Police and Fire Departments, Broadcast Stations and Businesses throughout the U.S. and many foreign countries.

Plus innumerable communications customers in the U.S.A., Canada, virtually all countries of Central & South America, the Caribbean Islands, and Europe; plus Africa, the Middle East, Thailand, Japan, China, the Philippines, Australia, etc., etc.

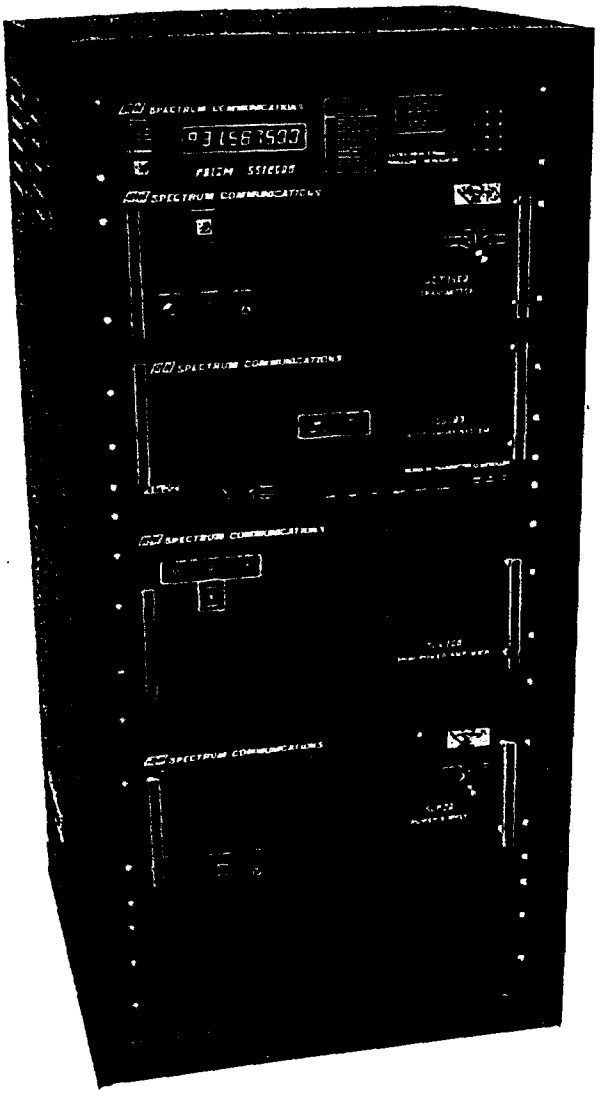
All of this was before we got into the Paging industry.

# SCT1500 SERIES VHF/UHF OR 900MHz HIGH PERFORMANCE PAGING TRANSMITTERS

*SIMULCAST OR CONVENTIONAL STABILITY*

For Ultra-High Stability Simulcast - See SS10,000 Data Sheet

## *10 -300 WATT UNITS*



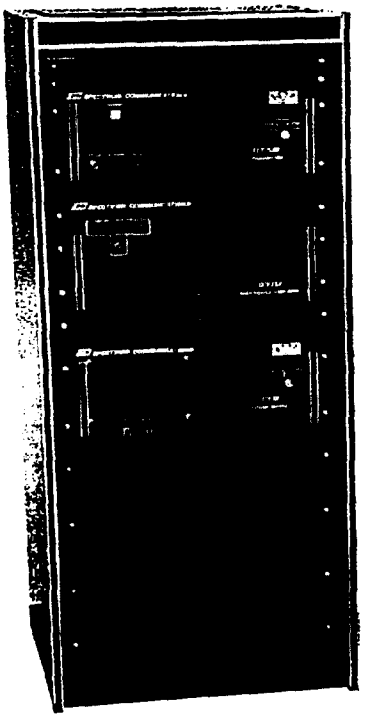
SCT1500 100-300W TX WITH
SIMULCAST SS10,000 & CABINET OPTIONS

**FEATURES**

- **TONE, VOICE AND DIGITAL MODULATION**
- **ACCEPTS ALL DIGITAL FORMATS. (POCSAG, GOLAY, ETC.)**
- **DIRECT FM, or DIRECT DIGITAL SYNTHESIS w/SS10,000**
- **100% SOLID STATE** ■**100% DUTY CYCLE**
- **PANEL METERS & LED STATUS INDICATORS**-For ease of maintenance & troubleshooting
- **AC or DC OPERATION**-With Battery Backup capability
- **OPTIONS: HOT STANDBY SYSTEM. EXCITER HIGH VSWR SHUTDOWN. GAS TUBE** for AC Line Lightning Protection
- **FCC TYPE ACCEPTED-PARTS 21,22,90**
- **RADIO LINKS AVAILABLE:** 72, 150, 450 MHz, OR 900 MHz TX
- **MADE IN USA** ■ **2 YEAR WARRANTY**

**The Spectrum SCT1500 Series of State of the Art Paging Transmitters incorporates the latest advances in solid state technology. They've been Proven Reliable through years of experience** with thousands of units operating successfully throughout the entire world—many in hostile environments. The Spectrum Direct FM Exciter provides precision high speed NRZ-FSK Digital Modulation for POCSAG and other formats as well as high quality/low distortion Tone and Voice Modulation. Three seperate inputs are standard — for maximum system versatility. Transmitter 'Turn-On' and 'Mode Switchover' Times are both superfast—*milliseconds.*

**Two Frequency Stability Options are available.** Either the SS10,000 .002 ppm Direct Digital Synthesis Oscillator/Modulator for Simulcast operation; or the conventional 1ppm oscillator/oven unit for nonsimulcast applications. 1 Channel is standard, but as an option, the SS10,000 can be programmed for many frequencies; and the std. SCT1500 set up for 2 channels.



SCT1500 100-300W TRANSMITTER
(NONSIMULCAST)
SHOWN IN OPTIONAL CABINET

**For 100-300 Watt units, automatic High VSWR and High Temperature Protection is included.** If high VSWR or Temp. is detected, or if there should be a failure in the P.A.'s power supply, the P.A. will automatically be "bypassed" and the exciter will stay on the air at the 30-40W level — for 100-150W units. For 200W units and higher, an Exciter Shutdown will be triggered. "Reset" for the 3 modes is *automatic.*

**The SCT1500 Exciter includes a built-in power supply, and a seperate high current supply is provided for the P.A.** Both provide superior regulation and filtering compared to common ferro-resonant supplies. M.O.V.'s help prevent damage from AC line spikes and transients. Massive transformers and oversize heatsinks are used throughout (plus high efficiency forced air cooling for the P.A.) for many years of cool, reliable operation. RF Shielding is the best in the industry.

**Servicing is simplified by the straightforward design and construction of these units.** The highest quality components and materials, such as lightweight yet rugged aircraft aluminum and all stainless steel hardware, are used to insure a high quality and reliable product.

**SPECTRUM COMMUNICATIONS CORP.**

*1055 W. GERMANTOWN PIKE NORRISTOWN, PA 19403-3924 U.S.A.*
*(610) 631-1710 (800) 220-1710 FAX: (610) 631-5017*

# SCT1500 PERFORMANCE SPECIFICATIONS

| | |
|---|---|
| **FREQUENCY RANGE** | **VHF:** 136-174, 66-88 MHz 275-285 MHZ \| **UHF:** 406-512 MHz \| 806-960 MHz 200 or 100W, 1-15W, or 10-40W nom. Variable |
| **RF OUTPUT POWER** SPECIFY | 300, 150, 75, 30, or 10W nom. (5 or 30W @ 66-88 MHz) (100 or 30W @ 280 MHz) \| 200, 100, 40, or 10W nom. (90, 35, or 8W nom. above 470 MHz) |
| | **Variable Power Option, and Amplifiers to 500W Available.** |
| **RF OUTPUT IMPEDANCE** | 50 ohms; 1.8:1 VSWR max. |
| **MODULATION** | Direct FM; and NRZ FSK for Digital Modes. (DDS with SS10,000) |
| **EMISSIONS** | 16KOF1D, 16KOF3D, 15KOF3D, 14KOF3E, 16KOF3E (Digital to 2400bps - SCT1500. Up to 6400bps with SS10,000) |
| **AUDIO DEVIATION** | ±5KHz Std. Adjustable. Built-in Limiter/Filter. |
| **AUDIO FREQUENCY RESPONSE** | To 3000 Hz. (6dB/octave preemphasis per EIA on Voice Input. No preemphasis on Tone Input.) |
| **AUDIO DISTORTION** | <2% typ. |
| **AUDIO INPUT LEVEL** | **600 OHMS BAL:**-20dBm to + 10dBm. **Hi Z:** 40mV to 2V rms. |
| **AUDIO INPUT IMPEDANCE** | 600 ohms balanced, and 10K ohms nom. unbalanced. **Separate Inputs for Tone, Voice & Digital.** |
| **DIGITAL INPUT** | TTL, CMOS and RS-232 compatible |
| **DIGITAL DEVIATION** | ±4.5 KHz std. Adjustable up to ±5KHz. |
| **ANALOG/DIGITAL SWITCHOVER TIME** | < 10 milliseconds |
| **SPURIOUS EMISSIONS** | -75dB nom. (At frequencies > 1MHz away when SS10,000 is used.) |
| **HARMONICS** | -66dB min. Multi-section lowpass filter built-in. (-59dB nom. on 900 MHz 40w unit.) Optional VHF filter, for -80dB min. harmonics. |
| **FREQUENCY STABILITY** (-30 TO +60°C) | **STANDARD SCT1500: ±1ppm nom.** **WITH SS10,000 SIMULCAST GENERATOR: ±.002 ppm nom.** |
| **FM HUM & NOISE** | -55dB typ, for std. unit w/o SS10,000. |
| **OPERATING TEMP. RANGE** | -30 to +60°C |
| **HIGH VSWR** | **1-40W:** Ballasted emitter power transistors withstand up to 10:1 VSWR for up to 1 min. without damage. (High VSWR Shutdown Option Available.) **100 & 150W:** Automatic P.A. "Bypass" in case of high VSWR. Auto. 2X reset. **200W & up:** High VSWR triggers Exciter Shutdown. |
| **RF CONNECTOR** | **VHF:** SO239 **UHF:** Type N |
| **POWER REQUIREMENTS** | 120/220VAC, 50 - 60 Hz. (Transformer pri. taps available @ ± 10%.) Or, 12.6 - 14 VDC. (13.8 VDC nom.) |
| **DIMENSIONS** | 100 to 300W Units: 22 x 22 x 48"H. w/Optional Cabinet 2-75W Xmtr./Exciter only: 19"W (Rk. mount) x 7"H x 14"D. |
| **WEIGHT** | 100 & 150W Units: 225 lbs. net (less front door). 10-75W Xmtr./Exciter only: 22 lbs. typ. net. 30 lbs. Packed. |

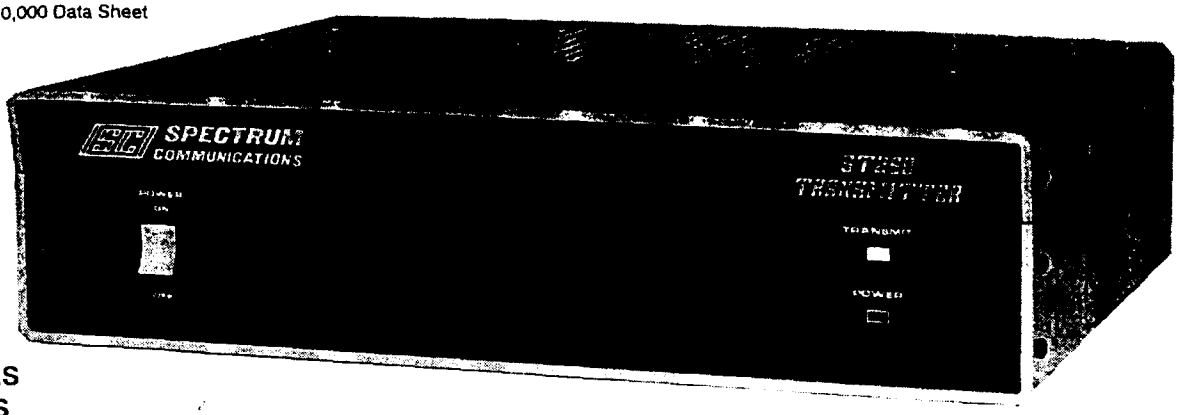
**ORDERING INFORMATION:** **SPECIFY:** **Frequency, Power Output, Stability, AC Line Voltage, Optional Cabinet, Other Options.**

# ST250A 'IN HOUSE'
# FM/FSK PAGING TRANSMITTERS

## *VHF, UHF, 900MHz* *1 - 10 WATTS - VARIABLE*

*CONVENTIONAL OR SIMULCAST STABILITY*

See Simulcast SS10,000 Data Sheet




**FOR**

**OFFICES**
**PLANTS**
**HOSPITALS**
**HOTELS & RESORTS**
**FIELD OPERATIONS, ETC.**
**SMALL SYSTEMS — OR "FILL-IN" FOR LARGE SYSTEMS**

*Field Proven Performance & Reliability - Worldwide*

Rack Mount Available

## FEATURES

- **TONE, VOICE AND DIGITAL MODULATION**
- **ACCEPTS ALL DIGITAL FORMATS**
- **DIRECT FM**
- **100% DUTY CYCLE**
- **AC POWER SUPPLY BUILT-IN**
- **SIMPLE INTERFACE TO THE TERMINAL**
- **FCC TYPE ACCEPTED-PARTS 21,22,90**
- **SMALL SIZE** ■ **LOW COST**
- **VERY EASY TO SERVICE**
- **2 YEAR WARRANTY**

**The Spectrum ST250A is a completely self-contained FM/FSK transmitter designed for 'Local' or 'In House' paging applications.** This compact, low cost unit includes a built-in AC Power Supply, audio circuitry, and an Analog/Digital Modulator. It requires only a paging terminal and antenna to provide full local paging - "In Plant" or for a few miles. Quarter wave whip (and larger) antennas are available.

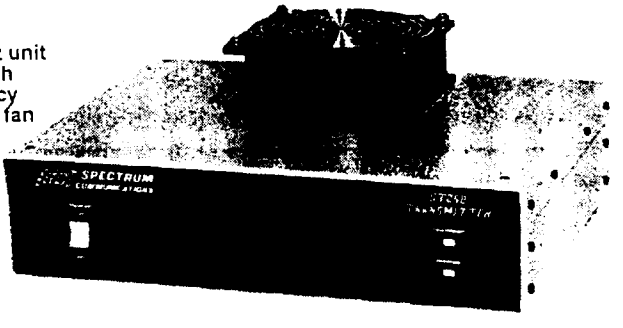
**The true FM Dual Modulator** provides precision high speed NRZ-FSK Digital Modulation for POCSAG, GOLAY, or any other format, as well as low distortion Tone and Voice Modulation. Interface to the terminal is very simple. A single line switches modes from Analog to Digital. Digital Data Input is a line accepting TTL, CMOS or RS-232 levels. Seperate Analog inputs are provided for Tone and Voice, (*each* with single ended *and* 600 ohm balanced inputs).

### IMPROVEMENTS IN THE NEW ST250A

- New Heavy Duty Housing provides superior RF shielding and mechanical rigidity.
- Better Heatsinking/Cooling for final amp & voltage regulator allow 100% duty.
- Large Power Transformer with *twice* the current rating
- Better Frequency Stability on UHF with improved oscillator/oven.

**For Conventional Stability Applications, a unique solid state Proportional Crystal Oscillator Oven is used** - *for high frequency stability.* For Simulcast Paging, the SS10,000 Ultra High Stability Generator is available as an option. Front panel LED's indicate power supply On and 'Transmit'. A M.O.V. helps to prevent damage from AC line spikes and transients. As with all Spectrum products, only the finest quality designs, construction, and materials (such as glass-epoxy) MIL spec P.C. boards, stainless steel hardware and an aircraft alloy aluminum housing) are used to insure a high quality, rugged product that will give many years of reliable service.

**900MHz unit with high efficiency cooling fan**




Fan normally not required on units at lower frequencies - unless operating 100% duty at ambient temps over 105 F

**SPECTRUM COMMUNICATIONS CORP.**

*1055 W. GERMANTOWN PIKE NORRISTOWN, PA 19403-3924 U.S.A.*

*(610) 631-1710 (800) 220-1710 FAX: (610) 631-5017*

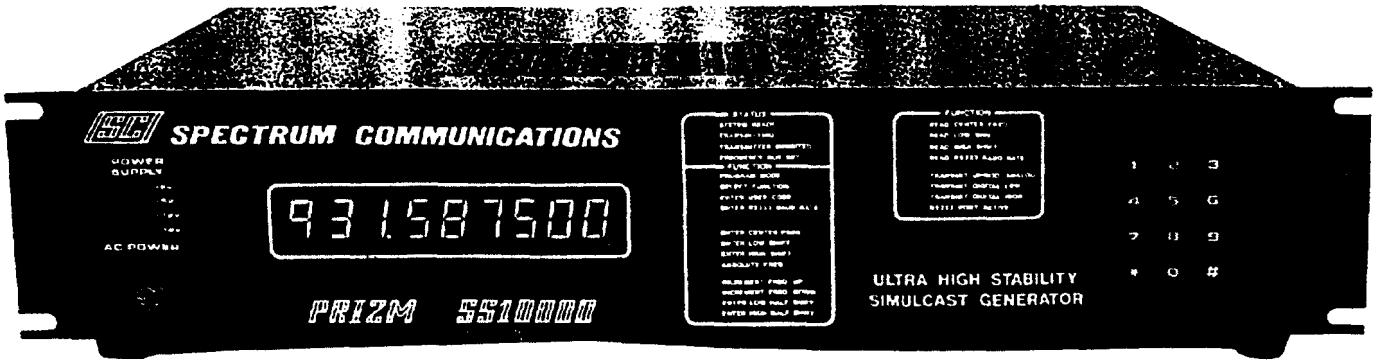
# ST250A PERFORMANCE SPECIFICATIONS

| | |
|---|---|
| **FREQUENCY RANGE** | VHF: 136-174, 66-88 MHz 270-290MHz UHF: 406-512 MHz, 806-960 MHz |
| **RF OUTPUT POWER** | 1 to 10 Watts Nom. Adjustable. (5W 66-88MHz) (8W nom. 470-512MHz) |
| **RF OUTPUT IMPEDANCE** | 50 ohms; 1.8:1 VSWR max. |
| **DUTY CYCLE** | 100% continuous |
| **MODULATION** | Direct FM; and NRZ FSK for Digital Modes |
| **EMISSIONS** | 15KOF3D, 16KOF3E, 16KOF1D, 16KOF3D |
| **BAUD RATE** | 1200bps - Std. 2400bps - Optional. To 6400bps w/SS10,000 Option. |
| **AUDIO DEVIATION** | ±5KHz Std. Adjustable. Built-in Limiter/Filter. |
| **AUDIO FREQUENCY RESPONSE** | To 3000 Hz. (6dB/octave preemphasis per EIA on Voice Input. No preemphasis on Tone Input.) |
| **AUDIO INPUT IMPEDANCE** | 600 ohms balanced, and 10K ohms nom. unbalanced. **Separate Inputs for Tone, Voice & Digital.** |
| **DIGITAL INPUT** | TTL, CMOS and RS-232 compatible |
| **DIGITAL DEVIATION** | ±4.5 KHz std. Adjustable up to ±5KHz. |
| **ANALOG/DIGITAL SWITCHOVER TIME** | < 10 milliseconds |
| **SPURIOUS EMISSIONS** | -75dB typ. |
| **HARMONICS** | -60dB min. Multi-section lowpass filter built-in. (-58dB nom. on 900 MHz unit.) Optional VHF filter, for -80dB min. harmonics. |
| **FREQUENCY STABILITY** (-30 TO +60°C) | **CONVENTIONAL:** ±0.0002% max. up to 512 MHz ±0.00015% max. 806-960MHz \| **SIMULCAST:** With Optional SS10,000 Generator - ±0.002ppm nom. |
| **OPERATING TEMP. RANGE** | -30 to +60°C |
| **RF CONNECTOR** | VHF: SO239 UHF: Type N |
| **POWER REQUIREMENTS** | 120/220VAC, 50 - 60 Hz. |
| **DIMENSIONS** | 12" W x 11" D x 3" H. (Not including rear fins.) 4 3/4"H with fan. |
| **WEIGHT** | Net: 8 lbs. Packed: 15 lbs. |

**ORDERING INFORMATION: SPECIFY:** Frequency; desired power output if known. (Power output will be set at 5W if not specified.) AC Line Voltage.

# PRIZM SS10,000 SIMULCAST
# ULTRA HIGH STABILITY FREQUENCY GENERATOR

*CUTTING-EDGE TECHNOLOGY! DIRECT DIGITAL SYNTHESIS (DDS) AND MICROPROCESSOR CONTROL*




**LOCAL & REMOTE PROGRAMMING**

**FEATURES**

- **FREQUENCY STABILITY:** ±0.002 PPM. (±2 PPB, or 0.0000002%). -30 to +60°C. (Ref. 25° C.) With ±.03 PPM/year typ. long term aging. The best in the industry.
- **FULLY PROGRAMMABLE:** Analog Frequency (Fo) Digital Low Frequency. Digital High Frequency.
- **ASYMMETRICAL OR UNUSUAL SHIFTS CAN BE PROGRAMMED** - Up to ±4999 Hz.
- **FREQUENCIES CAN BE PROGRAMMED DIRECTLY IN 1 Hz RESOLUTION, OR INCREMENTED UP OR DOWN IN ADJUSTABLE INCREMENTS.**
- **EASY LOCAL PROGRAMMING VIA FRONT PANEL KEYPAD. REMOTELY OR LOCALLY PROGRAMMABLE VIA THE BUILT-IN SERIAL PORT** (Available soon). RS-232 format compatable.
- **TRUE NRZ DIGITAL MODULATOR BUILT-IN. TRUE FM ANALOG MODULATOR, 600 OHM AND HIGH Z AF INPUTS AND AUDIO STAGES BUILT-IN.**
- **ACCEPTS ANY DIGITAL FORMAT UP TO 2400+ bps. (POCSAG, GOLAY, etc.) FUTURE UPGRADES WILL BE AVAILABLE FOR 4 LEVEL SHIFTS AND DIGITAL TRANSMISSION SPEEDS UP TO 6400 bps.**—for FLEX™ or ERMES codes, etc.
- **A FULL COMPLEMENT OF FRONT PANEL DISPLAYS ARE PROVIDED**—which greatly simplify operation. 9 Digit High Visability LED numeric display for Frequency & FSK Shift Readout to 1 Hz! 24 LED Indicators for Status & Control Functions.
- **EASILY INTERFACED TO SPECTRUM SCT1500 & ST250A SERIES VHF, UHF & 900 MHz TRANSMITTERS.** Retrofittable to existing transmitters. (17-21 MHz output range.) FCC Type Accepted with Spectrum transmitters.
- **USER-PROGRAMMABLE "PASS CODE"** — (entered via panel keypad or serial port) — Prevents unauthorized access to all control features. Numbered Command Codes access all control modes.
- **MEMORY BACKUP BATTERY** saves programming memory in case of power outage. (Built-in.)
- **100% MODULAR DESIGN:** All Boards & Modules Plug-in – for ease of service. ALL ICs have Gold Plated Sockets. (Note that on competitors' units — many ICs have NO sockets.)
- **CAPABLE OF BEING UPGRADED IN THE FUTURE** to generate QPSK Modulation for higher data rates, or even AM should future technology warrant it.
- **BUILT-IN 120/220 VAC, 50-60 Hz POWER SUPPLY.** Includes full unit Battery Backup.(Utilizes external standard 12VDC battery.)
- **SIZE:** 3 1/2"H x 13"D x 19"W. Standard 19" Rack Mount.
- **WEIGHT:** 10 lbs. net.

**NOTE:** Phase delay board is required at your link controller input.

FLEX™ is a registered trademark of Motorola

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**The SS10,000 is a "Top of the Line" Premium Ultra-High Stability Frequency Generator** designed for Simulcast Paging Transmitters, Repeaters, and other Base Station applications.

**Frequency Stability is among the best available on the market**—if not *the best!* **The Direct Digitally Synthesized design** provides Super-Stable Frequencies, as well as super-precise FSK Digital Shifts — *for optimum Simulcast operation.* (There is no analog shaping of the FSK waveform.)

**The Microprocessor-Generated Modulation** transition shaping will exactly match from one unit to the next. [On all points on the FSK waveform, the frequency difference will be *less than 1 Hz* (VHF) !] The Microprocessor precisely controls the waveform for minimum RF bandwidth. Accuracy of the FSK rise & fall times is within ±0.1uS nom. – *20X better than major competitors.*

While the SS10,000 uses extremely sophisticated technology, **installation and operation are very simple.** Only the Finest Quality Designs, Components and Workmanship are used throughout. Lightweight, yet rugged Aircraft Alloy Aluminum (gold alodyned) construction with stainless-steel hardware.

**SPECTRUM COMMUNICATIONS CORP.**

*1055 W. GERMANTOWN PIKE NORRISTOWN, PA 19403-3924 U.S.A.*

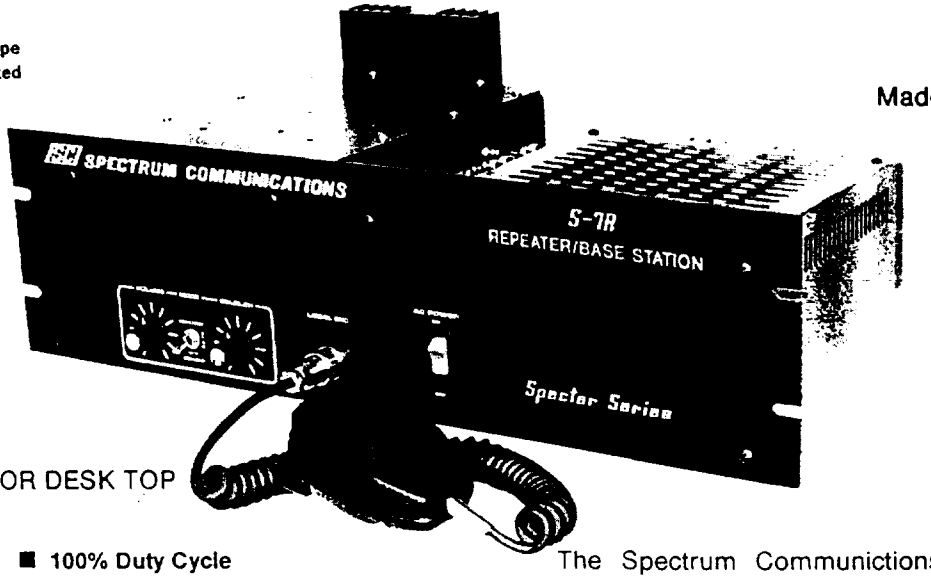
*(610) 631-1710 (800) 220-1710 FAX (610) 631-5017*

# S-7R VHF-UHF BASIC REPEATERS

## AND FULL DUPLEX LINK TRANSCEIVERS & BASE STATIONS

FCC Type Accepted

Made in U.S.A.




**10 -150 Watts**

**LOW COST**

19" RACK MOUNT, OR DESK TOP
shown with Optional Mic

- **100% Solid State** ■ **100% Duty Cycle**
- **10 or 30 Wt. VHF, 10 or 40 Wt. UHF Transmitters. 150W VHF and 100W UHF with SCA100 Power Amplifiers.**
- **Advanced Design Receiver**
- **Heavy Duty 115 or 220V AC Supply. Auto-Switchover to 12VDC Battery Backup, w/Trickle Charger.**
- **Small Size/Light Weight - yet rugged.** *(May be used 'Portable' in Emergencies. Mobile Duplexers available.)*
- **Includes: Basic Panel Controls and AC Pilot Light; Internal Adjustments for Timers, A.F. Levels, etc.; High Stability Crystals.**
- **Options: Local Mic, CW IDer (built-in), Variable TX Power.**

The Spectrum Communictions S-7R Repeater/Base Station line was developed to meet the demand for high quality/high reliability units at a reasonable price. The S-7R line uses advanced, yet conservative designs along with a maximum of ICs and other State of the Art devices for optimum performance, simplicity, and long-term reliability. As with all Spectrum equipment, only the highest quality designs, components and workmanship are used throughout to ensure years and years of superior service. 'Crossband' units are available.

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**The High Performance Receivers feature an 8 Pole Front End Filter (or optional UHF Helical Resonator Assembly) with a low noise/wide dynamic range RF Amp Stage.** Plus, a low noise Preamp is 'built-in' ahead of the RF Stage on 8 Pole Versions for super sensitivity. A Double Balanced Mixer follows the front end and is also a very wide dynamic range device - which, combined with the above, results in excellent Intermod, 'Desense' and Spurious rejection.

**Regarding Adjacent Channel Selectivity** – the receivers incorporate an 8 Pole First IF Crystal Filter, plus a 4 Pole second IF Ceramic Filter for superior adjacent channel rejection. An advanced design "Hysteresis" Squelch Circuit helps to minimize 'chopping' on weak, fluttery mobile signals, thus making typical weak signal operation much more pleasurable!

**The Transmitters are very stable, rugged, and able to withstand high VSWR loads and 100% continuous duty cycle.** The RF output spectrum is extremely 'clean', with spurious, harmonics, and "white noise" all very low. Most versions include proportional ovenized oscillators for high frequency stability in varying ambients. On the air, Spectrum Repeaters are famous for superb repeat audio quality - so good, *"It sounds like direct copy"!*

**Basic Front Panel Controls are provided,** while other adjustments are internal *to prevent tampering by unauthorized personnel.* AC Line Input is protected by a MOV (Metal Oxide Varistor) transient & spike suppressor. 600 ohm Audio Inut/Output is available.

## OPTIONS

- **CTCSS/Community Tone Panel** - Single Tone Synthesized Encoder/Decoder (**-PLR**) available "built-in'; or a rack mount Synthesized (**TP38**) Tone Panel may be supplied - up to 38 tones. Many additional features are available with this Tone Panel; e.g., DTMF control. Spcify freq.(s) **DCS** also available.
- **Matching Duplexers** - the very finest "Band Pass/Band Reject" design. #639 for 10W 136-174MHz Rptr. (#641 for 30W.) #678 for 406-512MHz. (Each Duplexer is carefully tuned and 'checked-out' with your repeater.) The highest quality RG-214/U **"Double Shielded" Duplexer Cables** are also available.
- **FL-4 Helical Resonator Front End,** (for UHF units only) – 4 super sharp 'helicals' greatly increase receiver rejection of strong local signals more than a few MHz away. (-33dB @ ± 5 MHz, -65dB @ ± 10 MHz.) In addition, Intermod spec. is improved by apx. 10dB due to wider dynamic range front end. **Highly recommended where there are many nearby transmitters!**
- **Various IF Filters** - 6, 11**(12 or 14 Pole),** 30KHz. (13KHz Std.)
- **OV-1 Receive Crystal Oven** – Greatly increases RX freq. stability. Especially recommended at UHF in cold ambients.
- **220V, 50-60z Power Supply**
- **Telephone Interconnect/Autopatch and/or DTMF Remote Control, (See Interconnect & TTC300 data sheets.)**
- **Cabinets** – 7" to 6'. (Low Cost to 'Deluxe' – Inquire.)
- **Base Station Antennas & 1/2" or 7/8" 'Hardline' Cable & Connectors. Cavity Filters.**

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# S-7R PERFORMANCE SPECIFICATIONS

## RECEIVER

| | |
|---|---|
| **Sensitivity** | 0.2-0.25 $\mu$V typ. for 12dB SINAD. 0.3$\mu$V max. (0.3 $\mu$V typ. with FL-4. 0.35$\mu$V max.) |
| **Squelch/COR Threshold** | 0.1-0.2 $\mu$V nom. Schmitt Trigger 'Hysteresis' Squelch – noise operated. |
| **Selectivity 12 Pole Filter** Std. Fltr. | -6dB @ ±6.5 KHz nom.<br>-75dB @ ±15 KHz nom.<br>>-125dB nom. @ ±25 KHz (20dB Quieting Method)<br>-85dB nom. (EIA RS-204B Method) |
| Opt. Sharp Fltr. #FL11 (12 Pole) (Only recommended where there is strong local activity at 15-25 KHz) | -6dB @ ±5.5 KHz nom. (20dB Qt. Method)<br>-104dB @ ±15KHz nom.<br>>-125dB @ ±25 KHz nom.<br>-94dB nom. (EIA RS-204B Method)<br>*[Steeper Skirt 14 Pole Fltr. available, #FL10]* |
| **'Desense'/ Overload** | With a 1 $\mu$V desired signal, 'desense' begins at appx. 50,000 $\mu$V @ ±600 KHz. (100,000 $\mu$V @ ± 1MHz W/FL-4 UHF). |
| **Image** | -90dB nom. (>-100dB Image with FL-4) |
| **Spurious Response** | VHF: -85dB nom. UHF: -90dB nom. |
| **Intermodulation** | -73dB nom. EIA. (-85dB nom. with FL-4) |
| **Modulation Acceptance** | 7KHz nom. |
| **I.F.** | Double Conversion. High Frequency 21.4MHz 1st IF greatly reduces image response. 455 KHz 2nd IF. |
| **A.F. Output** | 2.2W typ. @10% dist. Std. 5W typ. optional. |

## TRANSMITTER

**RF Output @13.8VDC**

| | | |
|---|---|---|
| VHF LOW PWR. | 10W Nom. (5W Midband.) | |
| MED. PWR. | 30W Min. | |
| HIGH PWR. | 150W Nom. 136-174MHz. SCA100V option. (#HFW) | |
| **UHF** | **406-470 MHz** | **470-512 MHz** |
| LOW PWR. | 10W Nom. (2W avail.) | 8W Nom. |
| MED. PWR. | 40W Nom., 37W Min. | 30W Min. |
| HIGH PWR. | 100W Nom. SCA100 option. (#HW) | 90W Nom. |

| | |
|---|---|
| **Final Stage** | Emitter ballasted transistor withstands 20:1 VSWR for up to 1 min. without damage. High efficiency heat sink. |
| **Duty Cycle** | 100% Continuous duty. |
| **Modulation 16K0F3E** | True FM for the ultimate in audio quality. Instantaneous deviation limiting. 5KHz nom. Adj. up to 7KHz. Each unit is factory calibrated for 1:1 input/output deviation, (e.g. 4KHz input dev.=4KHz output dev.) – adjustable. Pre-emphasis per EIA RS-152B. Hum & Noise on the carrier is negligible. *Overall system audio fidelity & quality is excellent—so much so that it's very difficult to tell the difference between 'Direct' and 'Repeat' copy.* |
| **Spurious** | -70dB min. -75dB typ. |
| **Harmonics** | -65dB nom. Multi-section lowpass filter built-in. |

## FCC TYPE ACCEPTANCE DESIGNATIONS

| Model Series | TX Pwr. | FCC Rule Parts | FCC ID Number |
|---|---|---|---|
| S-7R - VHF | 2W | 21, 22, 74, 81, 90 | B2Y8QRSCT500V-2 |
| | 10W | | B2Y8QRSCT500V-15 |
| | 30W | | B2YBQRSCT500V-30 |
| S-7R - UHF | 2W | 21, 22, 74, 90, 95 | B2Y8QRSCT500-2 |
| | 10W | | B2Y8QRSCT500-10 |
| | 40W | | B2Y8QRSCT500-40 |

**"Split-Channel" Versions Also Available For 12.5 KHz Channel Spacing. Adj. Chan. Selectivity = -85dB nom. EIA. (6 kHz B.W. IF Filter.)**

## GENERAL

**Frequency Range**

**VHF Unit**
136-174 MHz. 66-88 MHz. 216-240 MHz.
**UHF Unit**
406-512 MHz

| **Frequency Stability** | | | **Option** |
|---|---|---|---|
| | Rcvr. | ±0.0005% typ. (-20 to +60°C)<br>±0.001% max. (-30 to +60°C) | ±0.0003% typ. (-30 to +60°C) w/OV-1 Oven |
| | Xmtr. | | |

**VHF:** **FCC Type Acc. Unit:** ± 0.0002% max. (-30 to+60°C). Includes OS-18 Proportional Crystal Osc./Oven Module.
**Commercial Export/Amateur Unit:** ±0.001% nom. (-20 to +60°C). *Precision Grade Crystals used throughout – on all units.*

**UHF:** ±0.00025% max. (-30 to +60°C)
**Includes Proportional Solid-State Crystal Osc./Oven circuit. *Superior to common TCXO's.***

| | |
|---|---|
| **Operating Temp. Range** | -30 to +60°C |
| **Remote Control** | 'Inhibits' xmtr. remotely by shorting transmitter keying line to ground, at rear panel jack. |
| **Timers (All internally adjustable)** | "Time Out": 0.5 to 5 min. (typ.)<br>Carrier 'Hang' Time: 0.1 to 7 sec. (typ.)<br>ID Time: 0.5 to 10min. typ. (To 30min. max.) |

**All CMOS Control Logic – For very low current drain.**

| | |
|---|---|
| **Local Mic** | Optional handheld mic. w/coiled cord. Adjustable Mic. Gain. |
| **RF Connectors** | **VHF:** UHF SO239<br>**UHF:** Type N |
| **Accessory Jack** | For Tone Panel, Interconnect/Autopatch, TX Remote Control, DC out to aux. equipment, etc. Included: +5 and +13.8 VDC; RX AF out; Aux. TX AF input, (1K ohm)—adj. level; Aux. PTT—(gnd to xmit); COR transistor switch—(switches 'LO' with incoming signal); TX Control Line; Ground; CTCSS Tone Input, Output & Trigger. |
| **Panel Size** | 5¼"H x 19"W. Depth: 12". **NOTE:** TX Heatsink protrudes 1" above top of panel. |
| **Net Weight** | 22 lbs. **Shipping Weight:** 30 lbs. |
| **1 Year Warranty** | Covers parts & labor. Spare parts are normally factory stock. |